

***Speocirolana prima*, a new species from Tamaulipas, Mexico with a key to known species of the genus (Crustacea: Isopoda: Cirolanidae)**

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*Abstract.*—The twelfth species of *Speocirolana* is described, distinguished from its cogener *S. pubens* by the morphology of the male uropods. A key to the known species of the genus is given. A distribution map of species in the genus, known only from northeastern Mexico, is also presented.

To date 22 species of stygobitic cirolanids in nine genera have been described from freshwater caves, springs, and cenotes in Mexico (Botosaneanu and Iliffe 1999, Botosaneanu et al. 1998, Bowman 1964, Bowman 1981, Schotte 2000). Eleven of these belong to the genus *Speocirolana*, all collected from the eastern states of Tamaulipas, Nuevo Leon, Coahuila and San Luis Potosi (see Fig. 4). Specimens collected by Dr. Robert Hershler of the National Museum of Natural History and others contained the twelfth species, described herein as new. The material is deposited in the National Museum of Natural History (NMNH).

Key to known species of *Speocirolana*

- 1a. Apex of pleotelson acute . . . . . 2
- 1b. Apex of pleotelson rounded or truncate . . . . . 3
- 2a. Endopod of uropod one-half length of exopod; both rami broadly rounded apically . . . . . *Speocirolana thermydronis* Cole and Minckley, 1966 (Pozos de la Baccerra, nr. Cuatro Cienagas, Coahuila)
- 2b. Endopod of uropod more than one-half length of exopod; both rami tapering to nearly acute apex . . . . .  
. . . *Speocirolana hardeni* Bowman, 1992 (Bexar and Val Verde Counties, Texas)
- 3a. Apex of pleotelson rounded . . . . . 4
- 3b. Apex of pleotelson truncate . . . . . 6

- 4a. Protopod of uropod produced, extending beyond apex of pleotelson; length of frontal lamina three times width . . . . . *Speocirolana pelaezi* Bolivar y Pieltain, 1950 (Cueva de los Sabinos, nr. Ciudad Valles, San Luis Potosi)
- 4b. Protopod of uropod not extending beyond apex of pleotelson; length of frontal lamina less than three times width . . . . . 5
- 5a. Endopod of uropod in male club-like, parallel-sided and rounded at apex, longer than exopod . . . . .  
. . . . *Speocirolana pubens* Bowman, 1982 (Cueva de la Bonita, San Nicolas de los Montes, San Luis Potosi)
- 5b. Endopod of uropod of male not club-like; lateral margins tapering to very narrowly rounded apex, subequal to length of exopod . . . . .  
. . . . . *Speocirolana prima* n. sp (Nacimiento del Rio Mante, Tamaulipas)
- 6a. Exopod of uropod longer than endopod, hard, club-shaped and with large, round patch of dense setules at apex . . . . . *Speocirolana fustiura* Botosaneanu and Iliffe, 1999 (Sima Chupacable, Potreitos, Neuvo Leon)
- 6b. Exopod of uropod not as above . . . . . 7
- 7a. Width of posterior margin of pleotelson less than one-half width of pleotelson at base . . . . . 8
- 7b. Width of posterior margin of pleotelson greater than one-half width of pleotelson at base . . . . . 9

- 8a. Frontal lamina markedly narrow and elongate, bent almost to right angle at  $\frac{1}{2}$  of length; . . . . *Speocirolana lapenita* Botosaneanu and Iliffe, 1999 (Manantial La Penita, Ciudad Victoria, Tamaulipas)
- 8b. Frontal lamina not as above . . . . . 11
- 9a. Second antenna very long, reaching almost to end of pleotelson; frontal lamina strongly curved dorsally . . . . . *Speocirolana disparicornis* Botosaneanu and Iliffe, 1999 (Guayetejo Spring, Juamave, Tamaulipas)
- 9b. Second antenna not reaching past mid-length of pleotelson; frontal lamina flat, pentagonal in ventral view . . . . . 10
- 10a. Frontal lamina narrow in ventral view, length ca. 2.5 times width . . . . . *Speocirolana bolivari* Rioja, 1953 (Cueva de los Sabinos, nr. Ciudad Valles, San Luis Potosi)
- 10b. Frontal lamina broad in ventral view, length 1.5 times width . . . . . *Speocirolana endeca* Bowman, 1982 (Nr. Ciudad Victoria, Tamaulipas)
- 11a. Both rami of uropod extending beyond posterior margin of pleotelson . . . . . *Speocirolana guerrai* Contreras-Balderas and Purata-Velarde, 1982 (Cueva de la Chorrera, Linares, Nuevo Leon)
- 11b. Exopod of uropod subequal in length to pleotelson, endopod much shorter . . . . . *Speocirolana zumbadora* Botosaneanu, Iliffe and Hendrickson, 1998 (La Zumbadora, Municipio La Madrid, Coahuila)

### Systematics

Family Cirolanidae Dana, 1852

Genus *Speocirolana* Bolivar y Pieltain, 1950

*Speocirolana* Bolivar y Pieltain, 1950:211; Rioja, 1953:147–148; Bowman, 1964:233–234.

*Speocirolana prima*, new species  
Figs. 1–4

*Material*.—Holotype, USNM 1003987, male, total length 20 mm; Allotype, USNM 1003988, ovigerous female, total length 22 mm; Paratypes, 2 males, 4 females, USNM

1003989, Mexico, Tamaulipas state, head spring (nacimiento) of Rio Mantes (22°44'N, 098°57'W), just south of Ciudad Mante on west side of Highway 85, in soft sediment, coll. Steve Gerrard and dive team, 1 May 1988.

*Diagnosis*.—Male uropodal endopod subtriangular with 3–4 stout spine-like setae on medial margin; exopod lanceolate, glabrous and tapering to narrowly rounded apex. Uropods not sexually dimorphic. Both uropodal rami subequal in length and extending beyond apex of pleotelson by one-half of length. Exopods of pleopods 3 and 4 incompletely divided; division in exopod of pleopod 5 complete.

*Description*.—Male: Body length (Fig. 1A) about 3 times greatest width. Cephalon with slight tricuspid ridge on anterior margin, including small rostral point (Fig. 1G). Frontal lamina (Fig. 1E, F) pentagonal in ventral view, projecting anteriorly in lateral view. Integument minutely and sparsely granulate, with faint granular row on posterior margins of pereonites.

Pereonite 1 longest; pereonites 3–4 shortest, subequal. All coxae (Fig. 1B) with carinae; posterior angle of coxa 7 reaching epimeron of pleonite 3. Epimera of pleonite 1–3 produced posteriorly. Pleotelson shorter than basal length, posterior margin broadly rounded, lacking setae.

Antennule (Fig. 1C) reaching posterior edge of pereonite 1; flagellum containing ca. 21 articles, most bearing 1 or 2 aesthetascs. Antenna (Fig. 1D) reaching posterior margin of sixth pereonite in largest specimens; flagellum with ca. 41 articles.

Left mandible (Fig. 1I): incisor cusps less deeply separated than in right mandible; spine row (Fig. 1J) with 21 short, spine-like setae; molar with ca. 30 dentations; palp, article 2 bearing 25 fringed setae on outer margin and few fine, short setae on inner margin. Right mandible (Fig. 1K): spine row bearing ca. 20 short, spine-like setae; molar with ca. 27 mar-

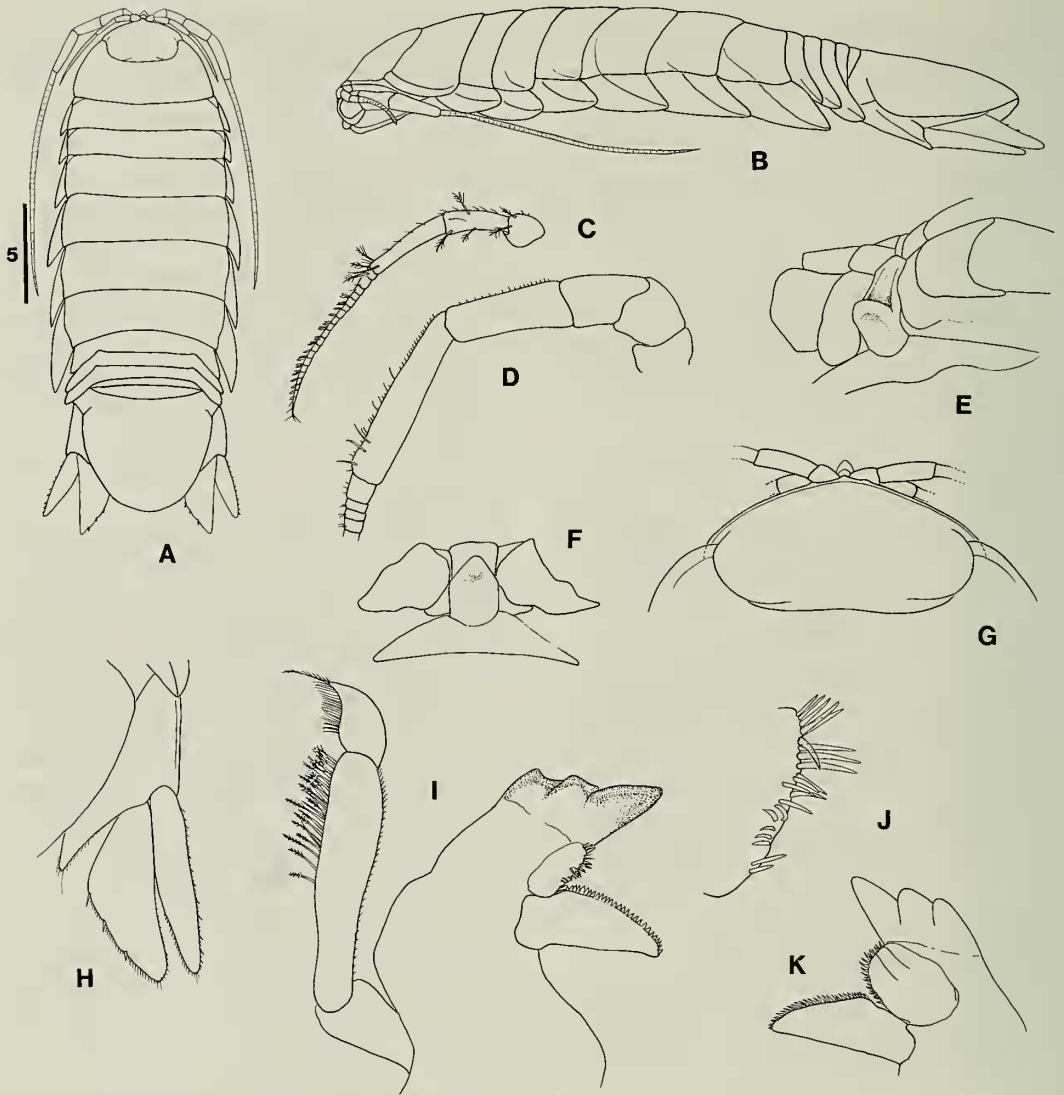


Fig. 1. *Speocirolana prima*, n. sp., male. A: habitus, dorsal view; B: lateral view; C: antennule; D: antenna; E: frontal lamina, oblique view; F: frontal lamina, ventral view; G: cephalon; H: uropod; I: left mandible; J: spine row (enlarged) of left mandible; K: right mandible.

ginal dentations. Exopod of maxilla 1 (Fig. 2C) with 11 robust spine-like setae, 6 or more bearing 3 tiny spinules on inner margins; endopod with 3 circumplumose setae. Maxilla 2 (Fig. 2B) with 7 long, simple setae on lateral lobe, 12 on middle lobe; 8 plumose marginal setae and 4 short, simple setae on medial lobe. Max-

illiped (Fig. 2A) bearing 2 coupling hooks and 11 plumose marginal setae on endite.

Pereopod 1 (Fig. 3A), propodus broad, greatest width  $0.6\times$  length, with 4 stout spine-like setae and fringe of small simple setae on mesial margin; carpus with single strong spine-like seta on mesial margin and merus bearing 5 stout spine-like setae

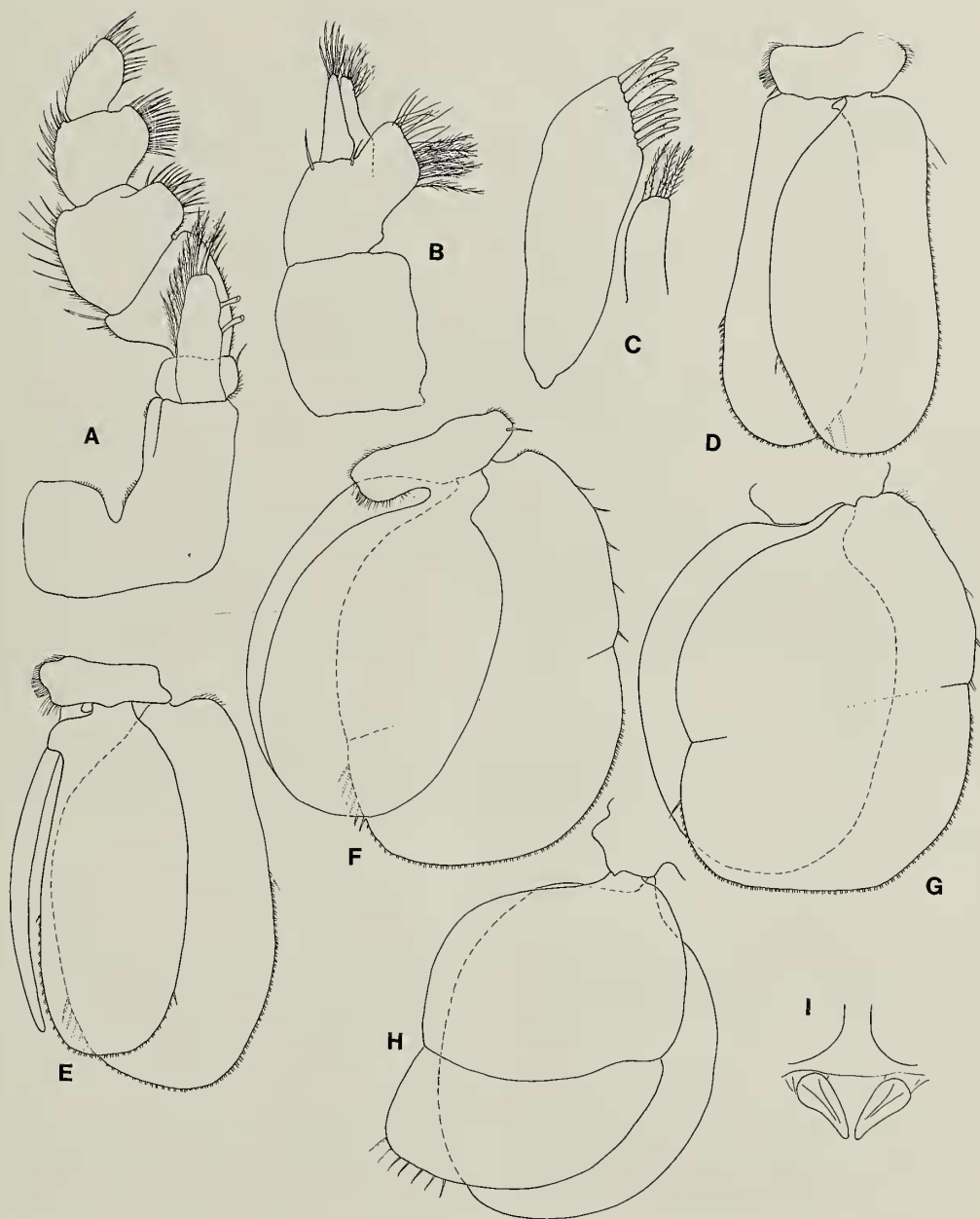


Fig. 2. *Speocirolana prima*, n. sp. A: pereopod 1; B: pereopod 2; C: pereopod 3; D: pereopod 4; E: pereopod 5; F: pereopod 6; G: pereopod 7.

distally. Pereopod 2 (Fig. 3B) and 3 (Fig. 3C) similar, propodus of each with 3 spine-like and numerous simple setae; carpi with 3 stout spine-like setae distally; meri bear-

ing 3 stout spine-like setae at anterodistal angle and 3 at posterodistal angle in pereopod 3, 2 smaller spine-like setae in pereopod 2. Pereopods 4 (Fig. 3D) and 5 (Fig.

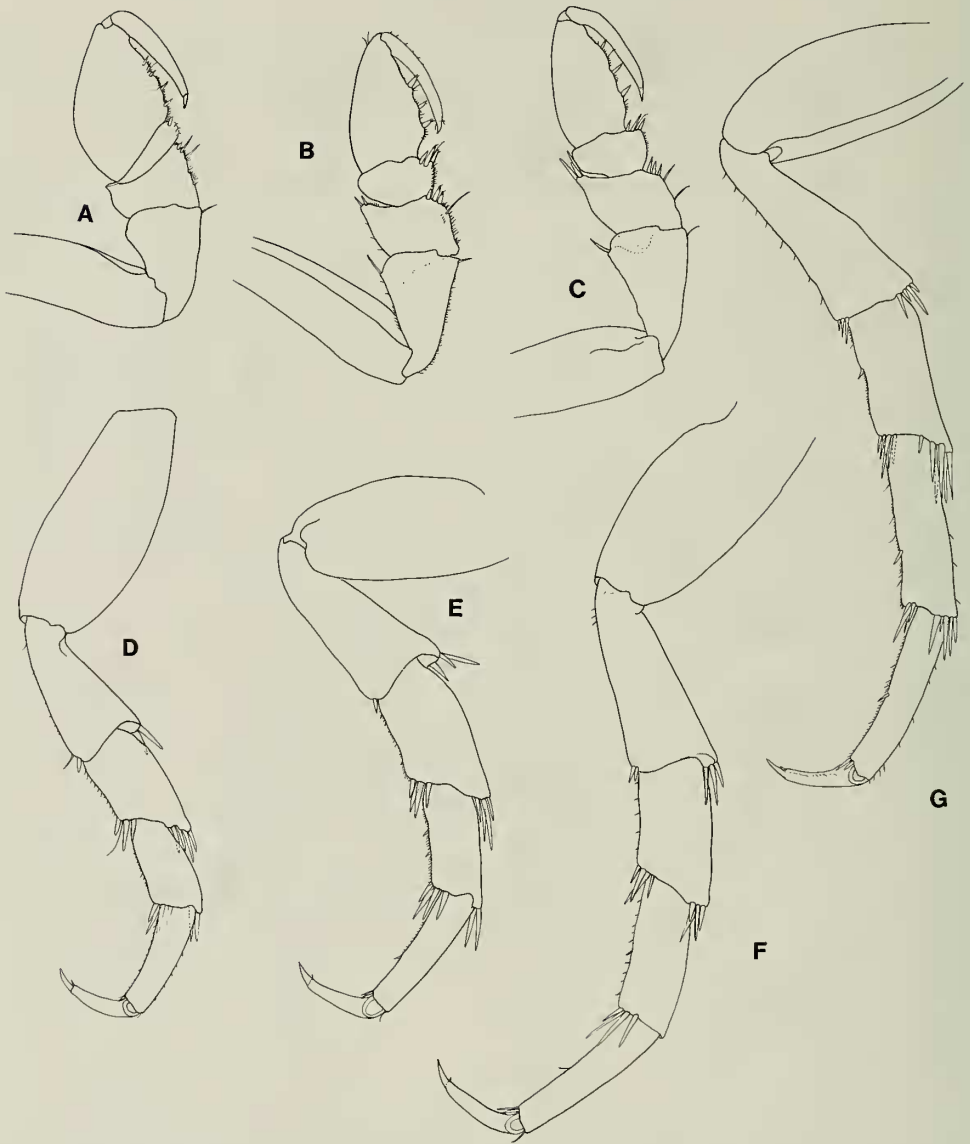


Fig. 3. *Speocirolana prima*, n. sp. A: maxilliped; B: second maxilla; C: first maxilla; D: pleopod 1; E: pleopod 2; F: pleopod 3; G: pleopod 4; H: pleopod 5; I: penes.

3E) similar with single spine-like seta at anterodistal margin of ischium and clusters of strong spine-like setae at distal angles of meri and carpi. Pereopods 6 (Fig. 3F) and 7 (Fig. 3G) with clusters of spine-like setae at distal angles of ischia, meri and

carpi, lacking at anterodistal angle of carpus in pereopod 6.

Pleopod 1 (Fig. 2D), 6 coupling hooks on peduncle; both rami elongate, length more than twice greatest width; endopod and exopod bearing about 31 and 75 plu-



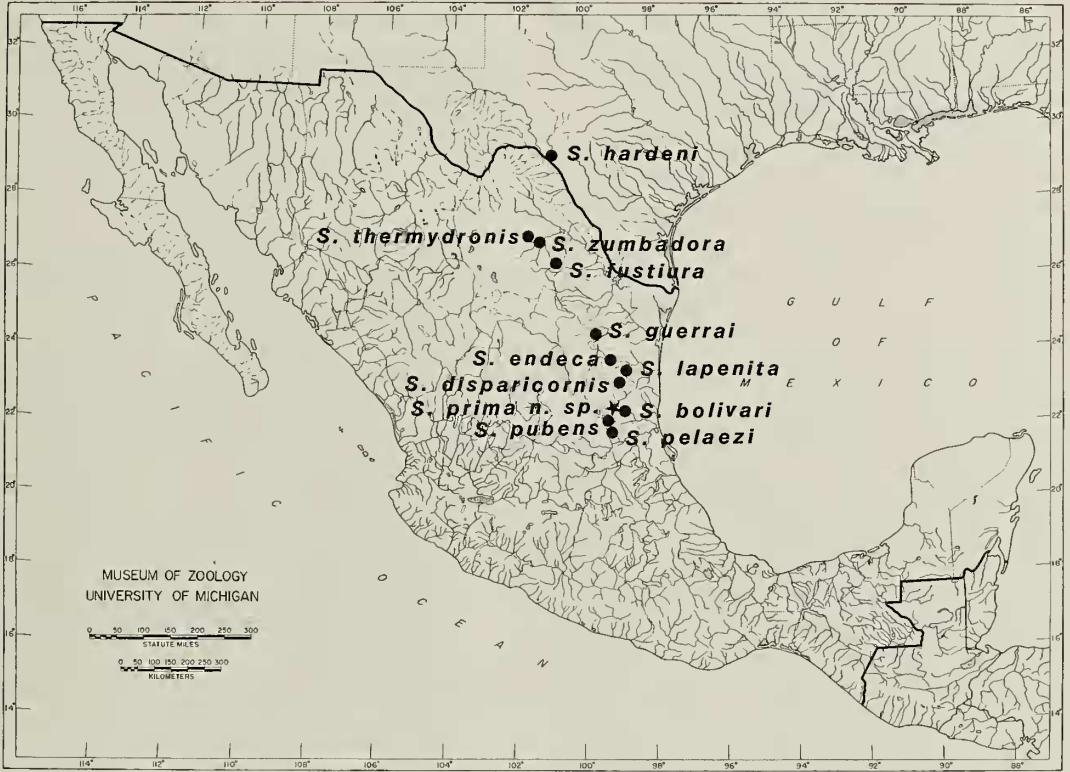


Fig. 4. Distribution of species of the genus *Speocirolana*.

mose marginal setae respectively. Pleopod 2 (Fig. 2E) of male, 6 coupling hooks and long setae on peduncle; appendix masculina inserted sub-basally, slightly curved, tapering to rounded apex and slightly shorter than endopod, latter having about 32 plumose marginal setae; exopod more than 50% wider than endopod and bearing about 77 plumose marginal setae. Pleopod 3 (Fig. 2F), 5 coupling hooks and several long setae on peduncle; exopod with incomplete suture visible and about 65 plumose marginal setae, lacking on endopod. Pleopod 4 (Fig. 2G), exopod incompletely divided, bearing about 80 plumose marginal setae, lacking on endopod. Pleopod 5 (Fig. 2H), exopod completely divided and with 7 plumose marginal setae, absent on endopod. Penial rami (Fig. 2I) large,

wedge-shaped and separated by a distance greater than width of single ramus; length of each ramus more than twice width.

Protopod of uropod (Fig. 1H) with strongly produced posteromedial angle, reaching half-length of exopod; endopod subtriangular with 3 (occasionally 4) spine-like setae on medial margin.

*Female*.—Indistinguishable from male except for sexual characters.

*Etymology*.—The species name *prima* is feminine and is Spanish for "cousin", since it is similar to its cogener *S. pubens*; the name is a noun in apposition. It is dedicated to my own cousin, Estela Gayosso Mendoza.

*Remarks*.—Bowman (1964), who raised *Speocirolana* Bolivar y Pieltain (1950) from a subgenus of *Cirolana* to generic sta-

tus, offers remarks on the relationships of known troglobitic Cirolanidae of the western hemisphere. A key separating the known genera is given there.

The new species described in the present paper is diagnosed by a unique combination of characters rather than any autopomorphies. It is most like *S. pubens*, whose type locality is about 125 km away to the south but in a different watershed. *Speocirolana prima* can be separated most readily by the uropodal endopod which in both sexes is lanceolate, narrowly rounded apically and is not pubescent as in the male of *S. pubens*, in which the uropodal endopods are sexually dimorphic. In the male of *S. pubens*, the endopod has parallel lateral margins and is apically truncate; in the female, it is not hirsute and lanceolate in shape. Further differences can be seen in the number of articles in the antennal flagellum (41 in *S. prima* vs. 24 in *S. pubens*); development of the sutures in pleopodal exopod 4 (complete in *S. pubens*, partial in *S. prima*), and the exopods of pleopod 4 in *S. prima*, which carry more marginal setae.

Whether the pleopodal exopod sutures are partial or complete seems not to be a consistent character state in this genus, therefore limiting its use. Those members of the genus showing complete development of the suture in the exopod of the third pleopod are *Speocirolana disparicornis*, *S. endeca*, *S. fustiura*, *S. guerrai*, *S. lapenita* and *S. zumbadora*. Those having incomplete development in this feature include *Speocirolana hardeni*, *S. prima*, *S. pubens* and *S. thermydronis*. The descriptions of *S. bolivari* and *S. pelazi* do not adequately define the status of this character.

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